Comment on essd-2022-287
Anonymous Referee #2

This manuscript is an update on the previous one (Petrescu et al., 2021), which synthesized and compared the estimates of CH4 and N2O emissions over Europe from NGHGI, and BU and TD approaches. The current manuscript follows the nice structure established in the previous version, while with improvements in uncertainty estimation and spatial patterns for posterior CH4 and N2O fluxes from inversions. The manuscript is well written with highlights on the improvements and changes compared to the previous version. A few comments and remarks as follows:

- As the results are mainly for 1990-2019 with few data in 2020, the title should not include 2020.
- The resolution of the figures are low at least in the current pdf version.
- Figure 2 and Figure 10: The bars between 2011-2015 and 2015-2019 are difficult to tell. In particular the yellow uncertainty range are almost invisible. It could be better to use two bars instead one bar for each estimates, which will give clearer information on both mean and uncertainty.
- Figure The colors for inland waters, peatlands and mineral soils, geological emissions and biomass burning are difficult to tell.
- Figure 4 and 13: It is a little surprising that top-down estimates varied a lot between Petrescu et al., 2021a and current study. It would be necessary to explain such differences (model improvements, site observation availability, satellite data availability etc.).
- L586: The differences in the trends could benefit a bit more explanation or discussion.
- L608-612: For such interesting findings, it is necessary to explain it more clearly. The current speculation is not easy to understand.
- L652: "Further" rather than "father".